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LysM, a widely distributed protein motif for binding to (peptido)glycans

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Table S1	**NCBI**	**Name**	**Specificity**	**Function**	**Loc/Nr LM**	**Loc Prot**
Prokaryotes						
Arthrobacter aurescens	AAS20113	Iap	protein p60 precursor		Centr / 1	unknown
Bacillus cereus	AAT84585	ExsA	spore resistance / germination	promotes anchoring of the	N / 1	spore
	CAB69802	Cwh	putative cell wall hydrolase		N / 2	Sec
Bacillus phage phi29	P11187	Gp15	phage lysozyme	Host cell lysis	C / 2	Sec
Bacillus subtilis	NP_388823	LytE	D.L-endopeptidases		N / 3	Sec
	O31852	CwlS	D.L-endopeptidases		N / 4	Sec
	O07532	LytF	D.L-endopeptidases		N / 5	Sec
	CAB13670	YneA		regulator	C / 1	Mem
	CAB11792	YaaH	spore resistance / germination		N / 2	spore
	CAB12390	YdhD	cortex-lytic enz		N / 2	spore
	CAB14216	YpbE			C / 1	spore
	CAB13277	YkuD	L,D-Transpeptidases		N / 1	spore
	CAB13251	YkvP			C / 1	spore
	CAB14744	SafA (YrbA)	spore resistance / germination		N / 1	spore
	CAB14771	SpoVID			C / 1	spore
	CAB13813	YocH			N / 2	Sec
Clostridium acetobutylicum	NP_349353	CAC2747	Chitinase		N / 2	unknown
Clostridium tetani	NP_781274	CTC00595	gamma-D-glutamyl-L-diamino acid endopeptidase I		N / 1	unknown
	NP_782564	CTC01995	2',3'-cyclic-nucleotide 2'-phosphodiesterase		C / 1	Sec
Desulfitobacterium frappieri	AAK95329	AY043467.1	chlorophenol reductase precursor		N / 1	Sec
Enterococcus faecalis	AAO80613	AtlA	Glucosaminidase	cell separation/autolysis	C / 6	Sec
	NP_816421	EF2795			C / 1	Lipo
Escherichia coli	AAC73316	MltD	transglycosylase		C / 2	Sec
	AAC74748	YnhG	L,D-Transpeptidases	Attachment of the Braun L	N / 1	Sec
	AAC74197	YcfS	L,D-Transpeptidases	Attachment of the Braun L	N / 1	Sec
	AAK26724	Eae			N / 1	Outer-Mem
	2018294A	NlpD			N / 1	Lipo
Francisella tularensis	ABD63926	FsaP		adherence to A549 humar	N / 1	Outer-Mem
Geobacillus kaustophilus	BAD74834	GK0549	N-acetylmuramoyl-L-alanine amidase		C / 1	Sec
group B *Streptococcus* (GBS)	AAG18478	Sip		surface immunogenic prot	N / 1	Sec
Lactococcus lactis	CAL96887	AcmA	N-acetylglucosaminidase	cell separation/autolysis	C / 3	Sec
	CAL97113	AcmD	N-acetylglucosaminidase	cell separation/autolysis	C / 3	Sec
Lactobacillus fermentum BR11	AAS55430	Sep			N / 1	Sec

Lactobacillales	YP_811461	LacCOG01826		unknown	C / 1	Mem
Lactobacillus salivarius UCC118	ABD99118	LSL_0304	Lysozyme	Phage lysin [Lactobacillus	C / 2	Sec
	ABD99615	LSL_0805	Lysozyme	Phage lysin [Lactobacillus	C / 2	Sec
		LSL_0090, LSL_0901, LSL_1267, LSL_1034, LSL_1036		Hypothetical proteins		Sec
	ABD99186	TagH	teichoic acid translocation ATP-binding	protein	C / 1	Mem
Lactobacillus plantarum	lp_0302, lp_0314, lp_0315, lp_2162, lp_0304, lp_2845, lp_2847			extracellular transglycosyl	N	Sec
	CAD65521	lp_3421	gamma-D-glutamate-meso-diaminopimelate	muropeptidase	N / 1	Sec
	CAD63286	lp_0681		phage lysin	C / 1	Sec
	CAD64709	lp_2401		phage lysin	C / 1	Sec
Lactobacillus reuteri	Lr0537, Lr858, Lr1267			Apf like proteins	N / 1	Sec
	Lr0299, Lr0342 and Lr1712			cell wall hydrolase	N / 1 and N/	Sec
	AAY86914	Lr1822	muramidase		C / 4	Sec
Lactobacillus reuteri DSM 20016	AAP97047	lre0012	endolysin phage phiAM2		N / 1	Sec
	AAP97073	lre0016	cell-wall hydrolase LytN-like protein		N / 1	Sec
	AAP94109	lre0018	aggregation promoting factor		N / 1	Sec
Listeria innocua	CAC97892	LIN2666			N / 2	Sec
Listeria monocytogenes	P21171	Iap, P60	murein hydrolase	cell division, generation of	N / 2	Sec
	CAC98958	Lmo0880			C / 1	Cell Wall
	CAC99381	Lmo1303			C / 1	Sec
	CAD00019	Lmo1941			C / 1	Mem
	CAD00600	Lmo2522			N / 2	Sec
	NP_466213	NamA (MurA)	muramidase	cell separation, autolysis	C / 4	Sec
Mycobacterium bovis	CAD94180	Mb1319	Esterase		N / 2	Sec
Micrococcus luteus, Mycobacterium	CAB09664	Rpf	Lysozyme like enzyme		C / 1	Sec
Mycobacterium tuberculosis	NP_217235	Rv2719c	cell wall hydrolase		C / 1	Mem
Neisseria meningitides	CAA09002	TspA		elicits immune response d	N / 1	Outer-Mem
Oceanobacillus iheyensis	BAC15012	OB3056	cell wall-binding protein		N / 2	Sec
Pteris ryuensis	BAE98134	prchiA	chitinase		N / 2	Sec
Renibacterium salmoninarum	AAM47180	LysB	Lysin		C / 1	Sec
Staphylococcus aureus	BAE47503	Sle1/Aaa	*N*-acetylmuramyl-$_L$-alnine amidase	cell separation/autolysis	N / 3	Sec
	Q2FYF1	EbpS		Elastin-binding protein	C / 1	Mem
	BAA33856	LytN	cell wall hydrolase		Centr / 1	Sec

	ABD29253	Protein A	IgG binding protein		C / 1	Cell Wall
Staphylococcus epidermidis	CAC80837	Aae / ScaA	*N*-acetylmuramyl-$_L$-alnine amidase	cell separation/autolysis	N / 3	Sec
	AAO04030	ScaB		secretory antigen SsaA-lik	N / 2	Sec
	AAO04134	ScaE			N / 1	Sec
Streptococcus thermophilus	AAW82373	Cse	cysteine histidine-dependent aminohydı	cellular segregation	N / 1	Sec
Streptomyces avermitilis	BAC69351	SAV1640	Peptidase		N / 1	Sec
Streptomyces coelicolor	CAB39706	AL939129.1	Peptidase		N / 1	Sec
Thermoanaerobacter tengcongensis	AAM25810	NlpD6	Endopeptidase		N / 1	Sec
Eukaryotes						
Caenorhabditis elegans	O16237	F07G11.9	chitinase		N / 12	Sec
Lotus japonicus	CAE02590	NFR1	Nod-factor receptor kinase		N / 3	Mem
	CAE02598	NFR5	Nod-factor receptor kinase		N / 3	Mem
Medicago truncatula	ABF50224	NFP	Nod-factor receptor kinase		N / 3	Mem
	AAQ73159	LYK3	Nod-factor receptor kinase		N / 2	Mem
Pisum sativum	CAE02596	SYM10	Nod-factor receptor kinase		N / 3	Mem
Arabidopsis thaliana	NP_566689	At3g21630/LysM	LysM domain-containing receptor-like k	chitin elicitor signaling	N / 3	Mem
	NP_175606	At1g51940	protein kinase family protein / peptidoglycan-binding LysM domain		N / 1	Mem
	NP_179957	At2g23770	protein kinase family protein / peptidoglycan-binding LysM domain		N / 2	Mem
	NP_180916	At2g33580	protein kinase family protein / peptidoglycan-binding LysM domain		N / 1	Mem
Oryza sativa Japonica Group	Q8H8C7	CEBiP	Chitin elicitor-binding protein precursor		N / 2	Mem
Gibberella zeae	XP_383730	FG03554.1	CVNH protein	sugar-binding antiviral pro	C / 1	
Botryotinia fuckeliana	EDN20091	BC1G_03481	CVNH protein	sugar-binding antiviral pro	C / 1	

pI	Remarks	Reference
5.89		Desvaux *et al* ., 2006
5.93	homolog of SafA of *B. subtilis*	Baily-Smith *et al* ., 2005
9.54		Desvaux *et al* ., 2006
10.00		Garvey *et al* ., 1986
10.28		Yamamoto *et al.* , 2003; Fukushima *et al* ., 2006
10.03	localizes at the celll separation s	Fukushima *et al* . 2006
10.00		Yamamoto *et al.* , 2003; Fukushima *et al* ., 2006
4.81	cell division suppressor during S	Kawai *et al* ., 2003
5.72		Kodama *et al* ., 2000
9.01		Kodama et al., 2000; Chirakkal *et al* ., 2002
5.58		Fukushima *et al* . 2006
9.95		Kodama *et al* ., 2000; Bielniki *et al* ., 2006, Magnet et al., 2007A and 2007B
9.49		Kodama *et al* ., 2000
5.78		Kodama *et al* ., 2000; Costa *et al* ., 2006
4.20		Kodama *et al* ., 2000; Costa *et al* ., 2006
7.73	SpsA subfamily	Ravagnani *et al* ., 2005
8.68		Desvaux *et al* ., 2006
5.23		Desvaux *et al* ., 2006
9.16		Desvaux *et al* ., 2006
5.58		Desvaux *et al* ., 2006
9.31		Béliveau *et al* ., 1991; Eckert *et al* ., 2006
5.21		Lepage *et al* ., 2006
9.88		Bateman and Bycroft, 2000
9.42		Magnet *et al* ., 2007A and 2007B
8.89		Magnet *et al* ., 2007A and 2007B
8.95		Bateman and Bycroft 2000; Hayward *et al* ., 2006
9.52		Lange and Hengge-Aronis, 1994
4.63		Mellilo *et al.* , 2006
9.65		Desvaux *et al* ., 2006
6.72		Borges *et al* ., 2005; Martin *et al* ., 2002; Rioux *et al* ., 2001
9.93		Buist *et al* ., 1995, 1997a, 1997b; Steen *et al* ., 2003, 2005a, 2005b; Bosma *et al* ., 2006; van Roosmalen *et al* ., 2006
4.52		Buist, Steen et al., unpublished)
8.65		Turner *et al* ., 2004

7.97	unique for Lactobacillales (ftp://ft	Makarova and Koonin, 2007
9.39		van Pijkeren *et al*., 2006
9.26		van Pijkeren *et al*., 2006
	hypothetical LysM proteins	van Pijkeren *et al*., 2006
8.97		van Pijkeren *et al*., 2006
		Boekhorst *et al*., 2006
9.37		Boekhorst *et al*., 2006
9.59	prophage Lp1 protein 58	Boekhorst *et al*., 2006
9.89	prophage Lp1 protein 56	Boekhorst *et al*., 2006
		Bath *et al*., 2005
		Bath *et al*., 2005
9.66		Bath *et al*., 2005
5.07		Wall *et al*., 2003
4.47		Wall *et al*., 2003
6.57		Wall *et al*., 2003
5.23	SpsA subfamily	Ravagnani *et al*., 2005
9.32		Lenz *et al*., 2003; Machata *et al*., 2005; Bierne and Cossart 2007
6.36	LysM and LPXTG	Bierne and Cossart 2007
4.61		Bierne and Cossart 2007
5.81		Bierne and Cossart 2007
5.70	SpsA subfamily	Bierne and Cossart 2007, Ravagnani *et al*., 2005
9.73		Lenz *et al*., 2003; Machata *et al*., 2005; Carroll *et al*., 2003; Bierne and Cossart 2007
5.69		Desvaux *et al*., 2006
4.20	essential growth factor, LysM su	Mukamolova *et al*., 2002a, 2002b, 2006, Ravagnani *et al*., 2005
11.64		Chauhan *et al*., 2006
4.33		Oldfield *et al.* , 2007
4.25	SpsA subfamily	Ravagnani *et al*., 2005
4.84		Ohnuma *et al*., 2008
3.66		Desvaux *et al*., 2006
9.67		Kajimura *et al*., 2005, Heilmann *et al*., 2005
5.86		Downer *et al*., 2002
9.48		Sugai *et al*., 1998

5.54		Bateman and Bycroft 2000
9.67	antigenic	Heilmann *et al*., 2003; Pourmand *et al*., 2006
6.02	antigenic	Pourmand *et al*., 2006
4.36	antigenic	Pourmand *et al*., 2006
3.91		Borges *et al*. 2005, 2006
9.96		Desvaux *et al*., 2006
9.20		Desvaux *et al*., 2006
8.98		Desvaux *et al*., 2006
8.44		Bateman and Bycroft, 2000
6.00		Madsen *et al*., 2003; Knogge and Scheel, 2006; Radutoiu *et al*., 2007
5.65		Madsen et al., 2003; Knogge and Scheel, 2006; Arrighi *et al*., 2006; Radutoiu *et al*., 2007
7.50		Arrighi *et al*., 2006; Mulder *et al*., 2006; Smit *et al*., 2007
6.09		Limpens *et al*., 2003; Knogge and Scheel, 2006
6.24		Arrighi *et al*., 2006
5.91		Wan *et al*., 2008; Miya et al., 2006
5.91		Wan *et al*., 2008
5.28		Wan *et al*., 2008
5.68		Wan *et al*., 2008
7.37		Kaku *et al*., 2006
8.75	CVNH type III	Percudani *et al.* , 2005
9.24	CVNH type III	Percudani *et al.* , 2005

Legend to supplementary Table S1
List of studied LysM containing proteins. Loc/nr LM, location and number of Lysin Motifs present; Loc Prot, cellular location of the protein; pI, determined using http://www.expasy.org/cgi-bin/pi_tool.

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